Elementum Bestia

A CLASSIFICATION SYSTEM FOR LARGE, UNIDENTIFIED MARINE ANIMALS BASED ON THE EXAMINATION OF REPORTED OBSERVATIONS

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ABSTRACT

Reports and descriptions of possibly unknown large, marine animals are available from many sources and mediums. By compiling the various records and reports and evaluating them for veracity, a remaining dataset was established. The dataset provides for affirmative theory descriptions of various serpent types which can be tested and compared to infrequent and subsequent reports.

METHODOLOGY

Observational data was collected and analyzed from over 118 sources to include personal communications, texts, journal articles, field reports, television/news accounts, newspapers, and the worldwide web, resulting in 1247 collected observations. These observations were entered into a spreadsheet for organization, receiving an observation tracking number that included the reference source of the report. Available and extrapolated data of each observation were recorded in a number of areas for analysis.

An observation then received a report description number unique to that observation. The description number includes the assigned observation number and letter abbreviations indicating particular elements of the observation. The description number includes the following data if appropriate to the observation: a designation for an actual observation of an organism (as opposed to a wave phenomenon, or water disturbance), a behavior of note exhibited by the animal, an act of predation observed or implied by the observer, a designation of an observation of a carcass or moribund animal, an observation where the locomotion of the animal is described, an observation by a qualified person (life scientist, or individual familiar with local fauna, etc.), vocalizations emitted by an observed animal, an observation of a juvenile animal (as judged by a substantial size difference when in the presence of another animal of the same type, or when compared to the average size of a similar animal), an observation of multiple animals during the same observation, the observer(s)' initial response (interest, fear, etc.), a physical characteristic of note observed on the animal, aggression displayed by the observed animal (either to other animals or the observer), an observation recorded before, or soon after, a natural event (earthquake, flood, storm, etc.), an observation directly related to a recent event (natural or man-made), an observation recorded in a location of note, and a designation of a capture and/or photograph of an observed animal.

The date, time of day, and season (if the date is incomplete), were also entered into the spreadsheet. Seasons in the northern latitudes were assigned as Spring; March 20-June 19, Summer; June 20-September 19, Autumn; September 20-December 19, and Winter; December 20-March 19. In the southern latitudes, seasons were designated as Spring; September 20- December 19, Summer; December 20-March 19, Autumn; March 20-June 19, and Winter; June 20-September 19.

A rating was assigned and recorded for each observation. That rating reflected the quality and accuracy, as determined by the elements of the observation rated for credibility with predetermined criteria (see Quality Control of Data).

The duration, or length of the observation, in addition to the distance at which the animal was observed, was recorded. Longitude/latitude coordinates were estimated from information provided in the reports and recorded. Physical characteristics of the water conditions and parameters from the location of the observation were recorded using general information provided by various texts, unless specifically stated by the observer. These characteristics included depth (National Geographic, 1990), salinity, surface temperature, water temperature (Ingamason and Wallace, 1985), typical wave and tidal conditions and characteristics, and the predominant current (Couper, 1983), if applicable. Additionally, atmospheric pressure, sea floor morphology, relation to earthquake frequency depth ranges, submarine heat flow, submarine sediment distribution, predominant winds, average wind speeds, mean annual rainfall, water column movement, typical thunderstorm activity, marine biogeographic area, phytoplankton production in the area, zooplankton production in the area, and benthic biomass production in the area, as provided by Couper (1983), the weather conditions at the time of the observation, and the weather conditions three days prior, and three days subsequent to the observation were also noted on the spreadsheet, if provided by the observer.

The number of observers per report, their activity at the time of the observation, and their immediate reaction to the observation were also noted. The number of individual animals per observation was also recorded, in addition to the numerical value assigned to the general type of animal observed.

Initially, an observation was classified with at least one of the following designations/descriptions derived from Heuvelmans' (1965) list (simplified for brief observations) of unidentified aquatic animals. It would become evident that some of Heuvelmans' animal types were not specific enough for differentiation, allowing for the inclusion of a reported animal into more than one type description. A second evaluation of the observations was then conducted, and additional, more specific descriptions of animal types and/or variations were included. The final animal types included the Long Necked Animal, Eel-Like Animal, Multiple-Humped Animal, Unidentified Animal (utilized when morphological details were unavailable and/or insufficient for inclusion into another animal type grouping), Other Type of Animal, Dorsal-finned Animal, Carapaced Animal, Cephalopod, Lizard-like Animal, Multiple-Limbed/Segmented Animal, Digited Animal, and Scaled Snake-like Animal. After the descriptions were determined, the labels were then designated as Type 1, Type 2, Type 3, etc. The physical dimensions of the animal were recorded, in addition to the animal's activity when initially observed, and the animal's response to the observer.

When possible, behaviors, descriptions, and locations were assigned numerical values to aid in the sorting process.

When the complete data set was recorded (1237 observations), it was sorted by a numerical, credibility rating. Repetition was also checked to ensure that no observation was included in the data set more than once. The observations were sorted by credibility rating (>=5), with observations under the credibility rating discarded from the final data set and analysis.

The sorted data set was then graphed (histogram, etc.) for each categories and compared to current theory, by referencing the data to existing literature. Patterns and behavioral trends were then established for each type of animal, and subsequently, patterns specific to a particular geography.

After the evaluation was completed, an abbreviated natural history was developed for the animal(s) types identified. A continued comparison to known species may aid in a more complete and correct proposal. A selected extant species, or where more appropriate, a species from the fossil record was examined and compared to increase the accuracy of the proposed natural histories. Comparison with an extinct species was necessary to address the theories of other researchers (Mackal, 1988) maintaining that the animals may be relict organisms.

QUALITY CONTROL OF DATA

Observations may have been old, second or third hand accounts, of questionable authenticity, or a case of mistaken identification, etc. A rating scale was developed to evaluate, and estimate the credibility and usefulness of each observation. It was understood that no evaluation process would be error free when reviewing all observations. In addition to unanticipated complications, undoubtedly, some observations are complete or partial fabrications. Also, the observer may have been sincere in relating the observation, but mistook a type of wave phenomenon, or known species or object for the unidentified animal. It was also considered that a false identification may be the result of distance (too great for accuracy, detail, or proper identification), lighting, emotion (fear, etc.), duration of the observation (too short for a detailed observation; Andrews, 1935.), and/or lack of any qualification (education, experience, etc.), to objectively and accurately evaluate and describe what was observed.

Each observation was reviewed and awarded points for an element met from a credibility rating list. A maximum score of eleven points could be awarded for each observation.

One point was awarded for an observation that was reviewed by a competent investigator and found to be credible. The investigator would be experienced and objective in such observations, and was experienced, and/or educated in a life science discipline.

A point was awarded for an observation made by a qualified observer. An observer was considered qualified by being formally educated in a life science, experienced through occupation (commercial fisherman, etc.), or with above average observational skills.

If the observer provided a detailed account or physical description of the animal, location, animal's activity, or elements of the account (date, duration, weather conditions, etc.), the observation was awarded one point. Descriptions such as "a big, snake-like thing" or "it looked like an upturned boat" were not considered detailed descriptions.

An observer with a known reputation for veracity, or with an occupational or societal position that may suffer, or be lost, if the observer was linked to a fabrication, was also taken into account. Consequently, the observation was awarded one point for the observer(s)' credibility.

If an observation was documented as witnessed by more than one individual, it was awarded one point. It was assumed that if more than one observer witnessed the event, the opportunity for exaggeration or fabrication would have been reduced.

Through personal experience with brief observations (and later verified by video) of similar sized animals (*Carcharodon carcharias, Zalophis californianus, Mirounga angustirostris, Eumatopias jubata, Phoca vitulina, Orcinus orca, Baleanoptera muscles, Eshrichtius robustus*, etc.), made at a distance on the surface, it appears that there is a maximum distance that an observer can provide a valuable, accurate narrative with the unaided eye. The author's personal experience has shown that the average maximum, effective observational distance with unaided eyesight, would be approximately 62 meters. An observation made at, or under this distance was awarded one point.

The longer the observation, the more accurate and detailed an observation could be expected. The likelihood of misidentification may also be reduced. An observation of 60 seconds or more was awarded one point.

If an observation included tangible, physical evidence (carcass, tissue samples, etc.), it was awarded two points.

A photograph, film, video, or sonar reading, helped substantiate some observations. As a result, an observation that was documented by photographic evidence and/or verifiable sonar reading was allowed one point.

Biogenic structures (changed landscape, prints, damage to involved objects, etc.), further substantiated an observation. Observations with such corroborating data were awarded one point.

A value of five points was decided as the minimum standard for an observation to be included in the final data set. By using this benchmark, it was assumed that an observation would have, more than likely, occurred. All observations received one point. By design, the majority of observations fell under the tolerance of five points, and was filtered, and excluded from the final data set. It is understood that even if a point was awarded for a particular category, that this award does not necessarily indicate that the category's strength was individually sufficient to substantiate an observation. This point system was designed to be used in totality, as no single category was intended to stand alone as corroboration.

QUALITY CONTROL RESULTS

After the sort by credibility rating, 358 observations (29%) remained from the original data set of 1247 observations. There was one observation with a credibility rating of eleven points. There were no observations with ten points, and four observations with a credibility rating of nine points. Fourteen observations were recorded with eight points, and thirty-eight with seven points. Eighty-two observations were awarded six points, and 209 received the minimum of five credibility points.

Of those observations discounted from the data set, 309 received four points, 320 received three points, 142 received two points, and 118 received one credibility point.

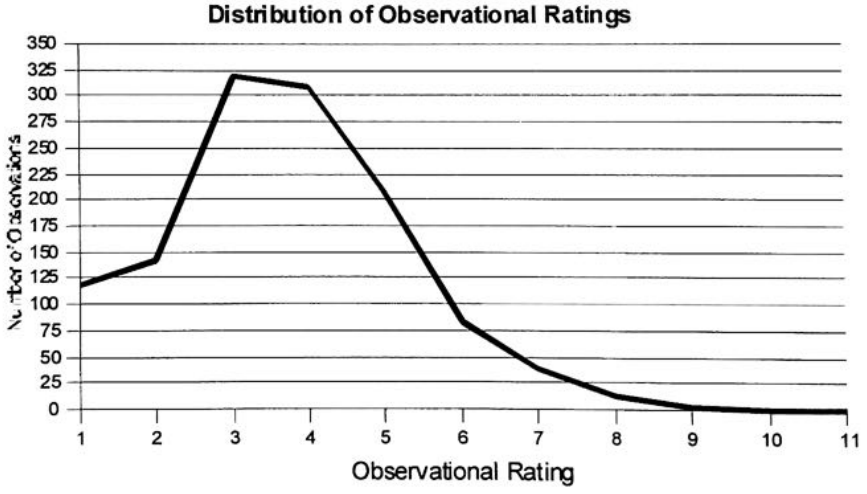


Fig. 1 The distribution of all observations (N=1237) by credibility rating score, with a mean score of 3.686, and a standard deviation of 114.782

Initially, the minimum credibility rating score was theorized to be five points. It was presumed that an observation with this minimum score would more than likely have taken place with a reduced opportunity for deception, and/or misidentification. Statistical analyses were completed from the observational data. To assist with subsequent research and comparison, "t tests", "z scores", and a Level of Significance One-Tailed Test were completed to evaluate the minimum retention score, and sensitivity of five.

Observations with a credibility rating of one, did meet the significance criteria. Observations with a credibility rating of two were significant to .0005. Observations with credibility ratings of three and four were not significant. Observations with a credibility rating of five were significant to .001, with observational credibility ratings of six, seven, eight, and nine significant to .0005. There were no observations with a credibility rating of ten, and one observation with a credibility rating of eleven, with an associated significance to .005.

A consistent, observational threshold appears to begin with observations rated for credibility with a score of five points, and in agreement with the original theory of a minimum standard of five points.

TYPE 1 - LONG-NECKED ANIMAL DESCRIPTION

The Type 1 Animal designation includes three descriptions. The generic, non-specific description of the Type 1 Animal was applied to animals reported in an observation without the detail required to place the animal into a more specific designation. A second designation was based on a long necked animal with a head perceived of a similar diameter as the neck. This criterion was proposed to eliminate, as much as possible, the reliance upon the observer's perception and dependence upon other characteristics (eye size, etc.). The third description required that the long-necked, Type 1 Animal was described with a head larger in perceived diameter than the neck. This animal received the Type 1B Animal designation.

TYPE 1A ANIMAL DESCRIPTION

Using the LeBlond and Bousfield (1995) table of Classification of Characteristics, the Type 1A Animal scored between the plesiosaurs, and primitive mammals. With the observation of short fibrous hair, it is least likely that the Type 1A Animal is like the plesiosaurs as it is more likely to be similar to a mammal.

Sirenians could be potential candidates, as the now-extinct Stellar's Sea Cow (*Hydrodamalis stelleri*) reached a similar length of 7.5 m. The Type 1A Animal appears to inhabit zones (pelagic and surface waters over the continental slope) primarily devoid of the plant material an herbivore would require. Additionally, the sirenians to not possess the pelvic appendages reported on Type 1A Animals. A more likely animal type for the Type 1A Animal, would be a species of otariid pinniped.

Heuvelmans (1965) also proposed that his proposed long necked animal was an unknown species of pinniped, and cited some of the potential objections to his long-necked pinniped theory. Foremost, pinnipeds tend to be gregarious and social animals, often observed in large groups on land. Additionally, pinnipeds are also tied to the land for breeding and birthing (Riedman, 1990).

Certainly, pinnipeds do appear to be gregarious and social animals, but Leopard Seals, Monk Seals, and Northern Elephant Seals, for much of the year, live solitary lives. Northern Elephant Seals have also been known to copulate in the water (Riedman, 1990), and are known to feed far off shore (LeBouef, 1996). Elephant seals feed primarily on the sea floor, and spend a very limited period time at the surface (Riedman, 1990 and LeBouef, 1996). With these reduced terrestrial ties used as examples, it could be proposed that the Type 1A Animal may also have a reduced, or non-existent, dependence on land.

The Type 1A Animal may occupy an environmental niche left vacant by other species of pinnipeds. Most species of pinniped feed at, or near the sea floor, and with the exception of the elephant seal, on the continental slope. The Type 1A Animal feeds at, or near, the surface in the epipelagic zone, and is therefore not in direct competition with any other species of pinniped, and becomes a representative of that animal order in an environment represented chiefly by elasmobranchs, large teleosts, cetaceans, cephalopods, and animals entering the epipelagic zone from the lower mesopelagic zones during diurnal migrations (Couper, 1983).

The epipelagic zone is a challenging area and environment to obtain food for a larger predator (Blue Planet, 2002). In such a difficult, featureless, foraging environment (Hunter and Mitchell, 1966), it may be advantageous to hunt and feed individually, than to rely upon the large, regular food supplies required to satisfy the metabolisms of a group of large, homeothermic animals.

Besides copulation at sea, the Type 1A Animals may have adapted to the point of birthing and nursing offspring offshore, like the sirenians. To date, Type 1A Animals have not been observed together. As such, Type 1A Animal young may have a brief, or even non-existent, nursing period, being precocial.

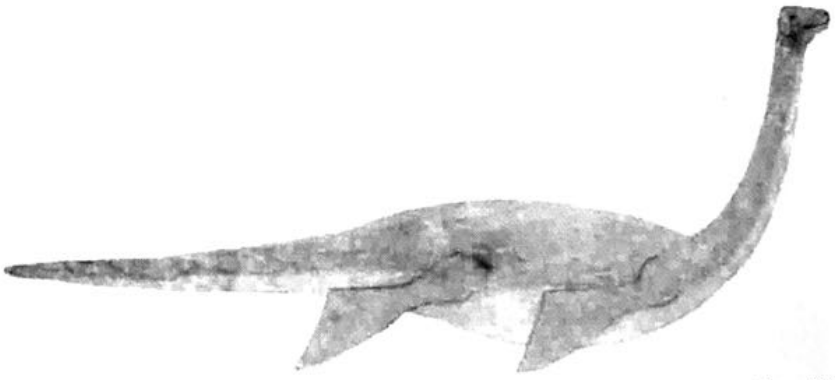
Another argument against the pinniped proposal might be the descriptions of a reptilian head, long neck, long tail, and large body. The pinnipeds have great diversity in head morphology. The heads of the Fur Seals (*Callorhinus sp.*), Hooded Seals (*Cystophora cristata*) and Elephant Seals (*Mirounga sp*) offer examples of the great morphological diversity of the order. An examination of the solitary Leopard Seal's (*Hydrurga leptonyx*) head, could include a description as "reptilian in appearance," and like that described in Type 1A Animal observations.

Many species of otariids have long, flexible necks. So much so, that they can fold their heads over their dorsums to their tails (Riedman, 1990). The Type 1A Animal's longer neck may have become an adaptation to capture the fast moving prey that typically occupies the surface zones, and to survey the surface at greater distances for foraging and breeding opportunities. Additionally Hunter and Mitchell (1966) suggested that fish occupying the oceanic and neritic zones orient towards flotsam and islands to acquire a visual stimulus in an optical void. It is possible the Type 1A Animal uses a periscope behavior (PB) for similar stimuli, or as a necessary navigational aid in periods of substantial planktonic bloom, when subsurface visibility would be minimal.

Pinnipeds have tails, though they are short and abbreviated. For an animal that only infrequently hauls onto land, an elongated tail could be an important adaptation for conservation of motion and energy when swimming continuously. The tail may also function as a food collecting tool like the Thresher Shark's (*Alopias sp*), or a counter balance to the long neck when engaged in spy-hopping (SH), or PB behaviors.

Some species of pinniped can grow quite large. Fur Seals (*Callorhinus sp.*) can weigh in excess of 450 kg, while the Elephant Seals (*Mirounga sp.*) grow to 6 m. in length and weigh in excess of 3700 kg (Nowak, 1983). A large body would be especially important for thermoregulation when hauling out is not an option. The extended surface area a bigger body would provide would be more efficient in heat conservation (Ellis, 1985).

Type 1 Animals assigned to the generic, non-specific description are most commonly observed in the open ocean, and only during the morning hours before 11:00 hours. Distribution appears to be within the northern and southern latitudes of 30-40o during the summer months, and proximate to the equatorial latitudes during the winter months. The only physical description listed, which would not place a particular report in a more specific category, refers to a heavy brow over each eye. This may be an adaptation to shield the eyes from the sun and glare that an animal frequenting surface waters, may be exposed to. It may also be an adaptation to protect the eye from flailing and struggling prey.



The Type 1A Animal is described with a small reptilian (turtle or snake-like) head. The head is also of the same, or lesser, diameter of the neck. The small diameter of the head, throat and neck would not allow the animal to ingest large prey items, or portions of larger prey carcasses. The mouth is often described as small, and terminal in position to the head. Such mouth placement is indicative of an animal's feeding strategy and niche (Nikolsky, 1978), and in this case, an indicator of an animal exploiting the mid-water epipelagic zone. It is therefore proposed that the Type 1A Animal preys upon fish and invertebrates primarily within the water column, on the surface, or in near-surface waters. The long, sinuous neck would also allow the Type 1A Animal to capture the quick and agile animals that inhabit the pelagic water column. The Type 1A Animal is described with a large, bulky body. As a consequence, the neck and small head would reduce drag and increase speed as the Type 1A Animal sought to capture prey with a neck/head movement, compensating for the lack of agility such a body would have.

Some Type 1A Animals displayed horns or projections on the head. In animals that were observed with head projections, multiple sizes and age classes were represented. It is likely that the head projections are secondary sex characteristics. Possibly, the Type 1A Animal utilizes the head projections during conspecific combat like that used by another long-necked mammal, the Giraffe (*Giraffa camelopardalis*). The male giraffe's skull also acquires additional projections as the skull elongates with maturity (Nowak, 1983). The horns or projections could also be the pinna of the external ear, like those on the otariid head.

The eyes of the Type 1A Animal are frequently described as red in color, though not all observed animals are reported with red eyes. The pigment in the eyes may be a secondary sex characteristic, or an adaptation to protect the eye from long periods of sunlight (especially with surface glare), or an indicator of temperature regulation like that exhibited in walruses (Riedman, 1990).

Type 1A Animals are described with large paddle-like pectoral and pelvic appendages. Likely, these appendages are rigid, and employed with an anterior-posterior stroking movement. This particular stroking movement would be efficient for an ocean going animal, especially when combined with the long, flattened tail. The tail appears to be as of similar length as the neck, and therefore may provide an effective counterbalance when the neck is held above and perpendicularly to the surface, or at a slight angle. Sea lions also swim at the surface with their heads extended above the surface (personal observation). The tail may also be utilized to direct, or herd, prey species into a more advantageous position for feeding.

The large, bulky body may be more efficient for assisting the animal in maintaining a core body temperature in the cooler waters the animal prefers to inhabit. Total body lengths of Type 1A Animals range from 2.5-12 m. The average length of the Type 1A Animal appears to be approximately 9 meters. The body is described as monochromatic and darkly colored. At times, slight dorsal counter-shading has been described. The appearance of the skin is smooth, and short, fibrous hair has also been reported.

Distribution of the Type 1A Animal is cosmopolitan, as also proposed by Heuvelmans (1965). The Type 1A Animal appears to have a preference for higher latitudes in temperate, boreal zones, and appears to be more likely to be observed in the spring. The Type 1A Animal has been reported twice in the southern hemisphere, and once in proximity to the equator.

Type 1A Animals have been reported in waters of varied salinity (33-37%), and once in freshwater. Area type designations in which Type 1A Animals have been observed, ranged from the open ocean, continental slope, <5 km inland, and once on dry land. However, Type 1A Animals are most likely to be reported from an area <16 km from the nearest coast. These observations may be reported in all types of weather and seas, and usually between the hours of 06:00-22:00.

The Type 1A Animal is likely to inhabit areas of sufficient phytoplankton and zooplankton production. Type 1A Animals are darkly pigmented, and it could be assumed that the animals feed at the sea floor like other darkly colored predators (Couper, 1983), but Type 1A Animals are usually observed in areas of low benthic biomass. These characteristics further substantiate the theory that these animals occupy the upper layers of the epipelagic zone. Further tying to the animal to the surface is the need for atmospheric air (the Type 1A Animal has been observed and heard exhaling at the water/air interface).

When the Type 1A Animal is observed, it is either displaying a SH, or PB behaviors. The Type 1A Animal's behaviors appear to be strongly oriented towards life at the water/air interface of the world's oceans. When the Type 1A Animal is engaged in these head displays, it is possible the animal is surveying the surface for disturbances, which may indicate feeding opportunities, or locating predators or conspecifics.

The Type 1A Animal also displays a behavior that includes a breach of the surface by at least 40% of the head and body. The animal displays the series with a minimum of three breaches (SDB). It does not appear that this is usual submersive behavior, as the animal is most frequently described as submerging with little or no disturbance. The animal may be escaping predators or dislodging parasites with this repeated behavior. The SDB behavior may also be a signal to potential mates or competitors. This behavior would seem plausible for an animal so behaviorally oriented towards the surface.

Observations including SDB behavior were only reported in the waters of the British Isles, which may indicate a possible staging, and/or breeding area. A darkly colored animal attracting a potential mate, or discouraging a potential rival would be difficult to see with a similarly colored landmass as a background. Such a surface display may aid the Type 1A Animal in visually announcing its presence.

A Type 1A Animal was observed once, >5 km inland in a small freshwater lake/bog (#16). The Irish lake is connected to a slightly larger lake by stream, and to then to a bay and the open ocean by a river. Also reported from Ireland, was the observation (#447) of a Type 1A Animal on land, .8 km from the water. The animal loped and swayed like a sea lion as it moved towards the nearest water. These two animals were the smallest reported to date. The animal observed on land was 2.7 m in length, and the animal in the shallow lake was 3.6 m in length. When the SDB of larger animals is taken into consideration, and the season of each observation (spring) it may be suggested that the Type 1A Animal utilizes the waters of the British Isles and other similar environments, as breeding grounds, and the networks of inland streams, bogs, and lakes as a nursery for younger animals until large enough to forage effectively, and/or evade predators.

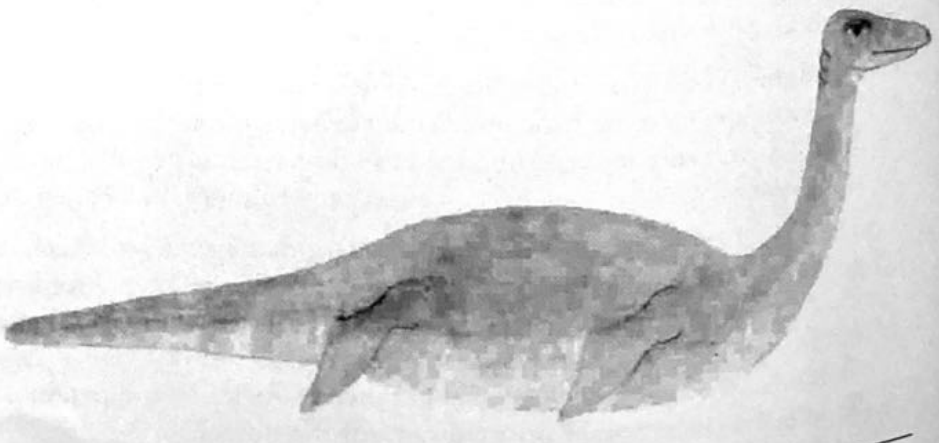
TYPE 1B ANIMAL DESCRIPTION

The Type 1B Animal scored 8 points on LeBlond and Bousfield's Classification of Characteristics, matching the plesiosaurs' index, and next closest to the primitive mammals. With this rating, it appears the Type 1B Animal may be a more primitive animal type than the Type 1A Animal, which scored 10 points on the same index. The characteristics the Type 1B Animal lacked, when compared to the Type 1A Animal, were the presence of visible vibrissae and limbs. Type 1B Animal observations were less frequent, and limited in number (5). It is possible the Type 1B Animal also has hair/vibrissae and/or flippers or appendages, and they were not observed during the observations. The skin is described as smooth, and mostly uniform in coloration; characteristics associated with mammals, as opposed to reptiles. Common to the majority of observations is a "ruffle" or series of grooves behind the head. The grooves could be gill slits, but this is unlikely in that the head is held above the surface of the water for extended periods. This characteristic is also indicative of a flexible, elastic skin, likely bunching and folding when the muscular neck required to support the large head, is flexed, or bent.

Cetacean necks are primarily immobile because their vertebrae are fused and do not allow for head/neck flexure (Nowak, 1983), and as such, are not proposed as candidates for the Type 1B Animal. The herbivorous sirenians are also not likely candidates. The Type 1B Animal's morphology is indicative of a carnivore, and it is therefore proposed that the Type 1B Animal is also mammalian, most likely belonging to the order Pinnipedia.

It is possible the Type 1B Animal is the same type of animal, though more robust, than the gracile Type 1A, but behavioral traits are dissimilar. The Type 1B Animal spends more time at the surface than the Type 1A Animal, and the physical descriptions are also different (head size and dimension, mouth size, etc.).

The Type 1B Animal is a robust form of long-necked, or Type 1 Animal. The neck is described as thick in appearance, and the head is also of robust dimension and of a diameter greater than the neck. The head was frequently described as cow, horse, or giraffe-like in appearance. The sub-terminal mouth runs 63% of the length of the head. The jaws are large, and the head and neck well-muscled.



The eyes appear round and large. The Type 1B Animal also appears to have better ariel eyesight when compared to the Type 1A Animal. Similarly, heavy brow ridges over the eyes are also reported, but no horns or head projections have been described. Type 1B Animals attain a total body length in excess of 17 m, with the body described with a darkly colored dorsum, and a lighter ventrum.

When the cryptic coloration, similar to other marine predators, is taken into consideration with the acute eyesight, it can be assumed that the Type 1B Animal is also predatory in nature. The large jaws with supporting musculature may allow the Type 1B Animal to prey upon and consume larger animals.

The Type 1B Animal was only observed in the North Atlantic Ocean, in proximity to the British Isles and Denmark. These areas have similar phytoplankton and zooplankton production levels and comparable quantities of benthic biomass. The salinity of the reported areas is narrow in variation, predominantly 35-36%. Type 1B Animal observations are reported primarily in the summer, and in all weather conditions.

The Type 1B Animal was observed in the presence of cetaceans in 60% of the recorded observations. The cetaceans were not reported to be "mobbing" or evading the animal as an expected behavior if the Type 1B Animal were in the process of preying upon them. However, the observer may not have been aware or familiar with such cetacean behavior, and unable to interpret the cetacean behavior accurately. Like the Type 1A Animal, the Type 1B Animal may have been using the activity, or prey locating abilities of the cetaceans as a method of locating prey. The Type 1B Animal is also solitary in nature, and may use the large pods of cetaceans as protection from predation. It may be expected that a predator would be less likely to approach a large group of cetaceans undetected, and thus the Type 1B Animal is able to avail itself of an "early warning system" against predators.

The Type 1B Animal is observed during a period which overlaps the period the Type 1A Animal inhabits the same waters. The animals may be conspecifics, but are more likely to be competitors exploiting similar niches. It is also possible the Type 1B Animal preys upon the Type 1A Animal.

TYPE 2 - EEL-LIKE ANIMALS

The Type 2, or Eel-like, Animal was generically described and categorized as a rigid, cylindrical animal, and comprised 9.5% of all animal types in this study. In recorded observations, the Type 2 Animal was described as a "serpent", "eel-like", or a "cross between a whale and an eel." The general description promoted reassignment of any observation with the description of an animal with multiple humps, so as not to include a possibly different animal type. Closer examination of recorded observations indicates at least three variations of Type 2 Animals.

The first, designated the Type 2A Animal, has a scaled, or armored skin. These animals comprised 12% of Type 2 Animal observations, and 1% overall. The second variety was labeled the Type 2B Animal, with a pointed snout and/or head. Type 2B Animal observations constitute 12% of Type 2 Animal observations, and 1% overall. The Type 2C Animal has a blunt, or rounded, head and made up 24% of all Type 2 Animal observations and 2% of all animal types in this study. The remaining percentages were generic descriptions.

TYPE 2A ANIMAL DESCRIPTION

Using a vertebrate classification table, the Type 2A Animal scored 8 points, placing it between plesiosaurs and modern reptiles. It is proposed that the Type 2A Animal belongs to the class Reptilia, with accompanying genus and species. The Type 2A Animal appears to maximize an environmental niche (benthic invertebrate prey) not currently exploited by reptiles.

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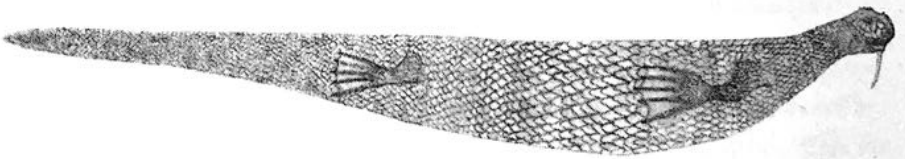
The Type 2A Animal has multiple, physical and behavioral characteristics sustaining the reptilian assignment. Firstly, the Type 2A Animal skin is described as scaled or plated; a primary characteristic of reptiles. Like other known reptiles, the Type 2A Animal appears to be ectothermic, and engaged in behaviors affecting internal temperature regulation. Type 2A Animals migrate to areas in an eccritic temperature range (17.5oC). Diurnal reptiles regularly bask in the sun's rays to regulate internal body temperature (Bellairs, 1970), and a known behavior of the darkly pigmented, tropical sea snake, *Pelamis platurus* (Breen, 1974). The Type 2A Animal has been observed basking (FM) at the surface in 25% of the observations (the darkly pigmented body coloration could also aid in heat absorption and retention).

The Type 2A Animal has been described with mucous emanating from the mouth. Marine animals possess organs, systems, or behaviors for conserving water and excreting excess salt. Certain species of sea snake possess a natrial gland in the palate for the excretion of excess salt (Bellairs, 1970). It is possible the mucous discharge is a similar method of salt excretion.

Nostrils were not reported in Type 2A Animal observations. In many species of aquatic reptiles, nares are not conspicuous. Like other reptilian aquatic species (Bellairs, 1970), the 2A Animal likely has valved nares. There have been no recorded visible and/or audible exhalations by the Type 2A Animals at the surface. The author has observed multiple species (*Erpeton sp., Archochordus sp., Caiman sp., Caretta sp., Trionyx sp., Eunectes sp.*) of aquatic reptile surface after extended submersion, and has noted that all do so without noticeable respirations, while cetaceans and pinnipeds may exhale above the surface noticeably.

A variety of reptiles display horns or cutaneous appendages (*Chameleo sp., Ceratophora sp., Erpeton sp.* etc.). In one of the Type 2A Animal descriptions (observation #79), the head projection was described as a horn, but in similar subsequent observations the projections were compared to walrus tusks. Certainly, the known reptiles are represented by types with elongated teeth (ie viper fangs), and it is possible that the "tusks" are a component of a venom delivery system, but the animal is usually observed in areas with a low zooplankton production, and therefore limited in the distribution of larger potential prey items. It is also possible the teeth are secondary sexual characteristics, and may display a length consistent with maturity.

The Type 2A Animal is observed in areas with a variety and quantity of bivalves, crustaceans, and other benthic species. The body coloration (dark, but not cryptic), could conceal the animal's presence to potential predators as the Type 2A Animal foraged along the bottom. The pendulous, protruding lips and mouth position (sub-terminal to ventral) also suggest a lower water column or substrate feeder (Nikolsky, 1978). The tusks could be used to locate buried bivalves and fishes, or to dislodge oysters, mussels, etc. from their positions. The mouth appears adapted to remove, by suction, prey items from crevices and/or buried in the substrate.



Type 2A Animals have the general description of a scaled (oval to diamond shaped in appearance), or armored animal with a dark uniform coloration. The body is described as large and bulky, with the width of the body 8-18% of the total body length. The animal averages 6-9 m of total body length, but a specimen (#683) of 30 m was reported. The distance at which this observation was made, and the available lighting was unavailable to confirm the accuracy of the length estimate, in the otherwise specific description.

The head is described as square and approximately 5% of the total body length. The mouth is sub-terminal to ventral in position, with "pendulous lips." Nostrils are not mentioned, but tusks, or horns, have been observed in 75% of the observations. Tusked individuals are 10 m in length, or greater. Smaller individuals were observed as they swam just below the surface, and therefore, did not offer a vantage point for observing possible tusks. Eye color has been described as red (in a 30 m tusked individual).

In one observation, a dorsal fin was described, though the Type 2A Animal is not usually described with fins, or limb-like appendages. On one occasion (observation #683), "fan-like" pectoral and/or anal fins were reported. The fan-like pectoral fins may function as a platform for the animal while engaged in substrate feeding. It is possible the appendages can be retracted, and held next to the body when not employed, and are

difficult to detect when in this position. The tail is described as long and "pointed." Because the Type 2A Animal has been described as a "rapid" surface swimmer, it is likely the tail and/or caudal area is dorso-ventrally flattened to provide the necessary surface area to propel the animal. Type 2A Animals exhibit a surface swimming behavior specific to the Type 2 Animal variety. The body is held rigidly and close to parallel with the surface, with the head remaining above the surface. Humpback Whales (*Megaptera novaeangliae*) also engage in this "motorboating" action as a surface demonstration behavior (Kaufman and Forestell, 1986).

It is likely the Type 2A Animal uses this "motorboating" behavior merely as an efficient means of locomotion at the surface. The tail is the primary means of propulsion, and the fan-like pectoral and/or anal fins would provide the lift necessary to maintain the animal's position at the surface, with this hydrofoil affect more energy efficient for migrating long distances. It is not likely to be demonstration behavior as the animal appears to be solitary (no conspecifics to observe the demonstration), and the behavior is extended for an extended period of time, as opposed to the behavior demonstrated by known cetaceans.

The scaled, chitonous reptilian skin would be necessary to prevent the skin from extensive sun damage after the prolonged exposure that would accompany the extended surface travel engaged in by the Type 2A Animal.

Type 2A Animals are observed a mean average of every 38 years, with the next proposed sighting proximate to the year 2007. The animals appear to be indigenous to the Atlantic Ocean only, predominantly along the northern west coast and west central areas. Type 2A Animals have been recorded in no other location(s), and never in the southern hemisphere. These animals have not been recorded significantly farther north than 40o north latitude, and appear to occupy the waters proximate to 40o north latitude in the spring and summer months. The Type 2A Animal migrates to southern latitudes (proximate to 20o north latitude) in the cooler, autumn and winter months.

The Type 2A Animal demonstrates a preference for warmer waters. The temperature range recorded was between 10-20oC, with a proposed eccritic temperature of 17.5oC+.

Observations of Type 2A Animals were reported in areas with a salinity between <32-37%. Type 2A Animals were recorded equally in the open ocean, <500 m from shore, and in shallow water (<36 m). Reports with actual observations times were limited, but the animal was observed once at 16:00 hours in the open ocean.

As with species of marine *Pelamis*, the Type 2A Animal is likely viviparous. The Type 2A Animal has not been observed on land. Additionally, the small scale (in proportion to the animal's body size) dimensions (20 cm x 10 cm x 10 cm) do not appear of sufficient size (Breen, 1974) to facilitate movement on land for breeding or egg deposition.

Type 2A Animals have not been observed with another conspecific. It is therefore likely that the Type 2A Animal is solitary by nature, and that breeding opportunities are transitory and brief. The young are probably born precocial, and are likely delivered in shallow water adjacent to shore in the lower latitudes. By birthing in the warmer waters in closer proximity to the equator, the juveniles are presented with an extended period of time to attain the size and physical strength needed for seasonal migration. The smaller size of the juveniles would also make them less efficient in absorbing and maintaining body temperature in cooler water as the larger adult or sub-adult.

TYPE 2B ANIMAL DESCRIPTION

Type 2B Animals displayed a cylindrical body, and a possibly mane-like feature (one observer was unsure if the feature was a mane, scutes, or fins). The head, or rostrum, is pointed or "beak-like," and may be difficult to distinguish from the main trunk.

The body coloration is cryptic, with a dark dorsal coloration and lighter ventrum. The skin has been described as textured with bumps, or "pimples." One observation (#286), reported "two long fins" at an unknown location on the body. The tail has not been described, but would be of sufficient surface area and orientation (horizontal) to support a surface swimming movement with no lateral movement, and the capability of generating the thrust necessary to facilitate a complete breach of the surface. Pectoral fins may also be necessary to provide the lift necessary to maintain the animal's continuous orientation while surface swimming (MB). The average total body length of a Type 2B Animal is between 7.5-9.0 m, with an occasional specimen of 30 m in length (this observation may have actually been a Type 3 Animal).

The Type 2B Animal is a pelagic, open ocean animal, distributed both in the Atlantic and Pacific Oceans. The available observations indicate the Type 2B Animal frequents the waters proximate to the equator (10o of latitude) in the autumn and higher latitudes (35-40o of latitude) in the winter. Water temperatures in these areas varied from 13-26o C, with 17o C being the apparent eccritic temperature. The Type 2B Animal is observed in areas with a moderate zooplankton production, moderate to high phytoplankton production, and moderate to high benthic biomass production. Considering the cryptic body coloration and area food production characteristics, the Type 2B Animal probably feeds in all areas of the water column. When the animal feeds on the benthos, it would be concealed from predators above it by the dark dorsal coloration and the dark substrate or dim light of the deeper open ocean water. The lighter colored ventrum would aid in the concealment of the animal's position from potential predators, when at the surface and silhouetted against a light sky (Klimley, 1989).

Type 2B Animals display SDB, and occasionally SH behaviors. MB was observed on one occasion. The animal did not offer acknowledgment of the observers when in close proximity or at a distance of 180 m.

Scoring 15 points in a vertebrate classification matrix, the Type 2B Animal has the same rating as a cetacean. The skin texture, behaviors (SDB, SH, MB), head morphology and coloration of the Type 2B Animal are consistent with that of a cetacean. The rigid trunk described in Type 2B Animal observations would be similar to the limited lateral movement of cetaceans (Nowak, 1983). The head of the Type 2B Animal appears similar to the sloped head and rostrum of *Ziphius cavirostris*, the Goosebeaked Whale. In mature males of *Ziphius,* the head can be difficult to distinguish from the trunk, with the sloped rostrum terminating into a short, pointed snout. It is therefore proposed the Type 2B Animal is a marine mammal, probably cetacean.

Type 2B Animals have been observed in SDB behaviors, breaching the surface anywhere from 5o to perpendicular. Beaked whales have been observed engaged in similar behavior (Nowak, 1983). It is thought whales display such surface oriented behaviors directed towards conspecifics, or as a means of dislodging parasites (Kaufman and Forestell, 1986).

Cetaceans tend to be gregarious (Ellis, 1985). With the exception of one observation (#286), Type 2B Animals are observed singly. Observation #286 records a large (30 m) animal circling a smaller "sausage shaped" animal. The animal in observation #286 meets the classification criteria of Type 2B Animals, with the smaller animal even more specifically. However, the larger animal demonstrated behavior observed in Type 3 Animals (PB), and was observed in a geographic zone (93) from which Type 3 Animals were frequently reported. The smaller animal may have been a conspecific, or prey. *Ziphius* form and travel in associations of 20-40 animals, with older males becoming solitary (Nowak, 1983). This may also be a similar behavior for Type 2B Animals.

Ziphiids have not been observed displaying MB behaviors. The one observation (#187) of a Type 2B Animal engaged in the behavior was in mid-winter, during morning hours, and proximate to the maximum northern range (41o N). MB behavior would pose a significant risk of sun damage to a cetacean engaged in such a prolonged activity. It is possible the Type 2B Animal only engages in MB behavior when the sun is at a position in which exposure could be minimized (the winter season, higher latitudes, and morning hours). In observation #187, the animal displaying the MB behavior was also described with a possible mane-like feature along the dorsum. Mane-like features were not reported, or not necessarily recognized, in all of the Type 2B Animal observations, regardless of size class. Though a mane-like feature is not a characteristic of currently described cetaceans, all whales do have hair in their embryonic stages, and a few mysticetes retain bristles around the oral area. It is possible the mane is a protective adaptation, or a non hair feature (fins, etc.). The feature in the observation could also have been fishing net, sea weed, or other unrelated article.

Type 2B Animals were observed a mean average of once every 40 years. It has been close to 80 years (1925) since the last recorded Type 2B Animal observation. For such a surface oriented animal to have gone unnoticed during this period (when marine traffic has increased), may indicate the Type 2B Animal population is in decline, and/or extinct.

TYPE 2C ANIMAL DESCRIPTION

The Type 2C Animal scored 9 points on a vertebrate classification matrix. This rating placed the Type 2C Animal taxonomically between modern reptiles and primitive mammals. When considering the physical descriptions, environments, and behaviors of the Type 2C Animal, it is likely, and therefore proposed, that the Type 2C Animal be assigned to Class Reptilia.

Type 2C Animals were distinguished by their rounded, blunt reptilian or "cow-like" heads. The cylindrical body appeared rigid when the animal moved at the air/surface interface. It could be proposed that if the Type 2C Animal was reptilian, it would demonstrate greater lateral flexibility. The legless lizards (*Ophisaurus sp.*) also appear to have limited lateral flexibility which aids them in their sub-surface, locomotion and burrowing (Bellairs, 1970). The Type 2C Animal's rigid body may assist in reducing drag (Denny, 1988) and attaining the high, sustained swimming speeds (Storer, et al, 1979) that are typically reported.

The diameter of the body is approximately 10-16% of the total body length. The total body length of the Type 2C Animal ranges from 5.5-30 m. Most commonly, the animal was in the 18-24 m size range. The dorsal coloration is described most commonly as ash, gray, or dark brown with a ventral coloration of cream, white, or pale yellow. The cryptic coloration described on Type 2C Animals may serve two purposes. The darker coloration may aid in the absorption and retention of heat (Breen, 1974), and the lighter ventral coloration may obscure the Type 2C Animal's presence to potential predators from below when it swims and breathes at, or near, the surface. The throat area was described in one observation as red. Commonly, reptiles (especially males) utilize coloration displays towards conspecifics (Breen, 1974). These colorations may also be variable or seasonal, indicating reproductive intentions or physical condition (Bellairs, 1970).

83% of the Type 2C Animal observations described an animal with dorsal scutes, a feature observed commonly in terrestrial reptiles (*Chamaeleo sp., Iguana sp., Basiliscus sp., etc*). Because the dorsal serrations are not observed on all animals, the scutes may be a secondary sex characteristic, or soft rayed and retractable (not displayed in animals not reported with dorsal serrations). Scutes, scales, or dermal plates are uncommon in mammals (*Dasypodidae sp., Manis sp.*), and unknown in marine forms.

The length of the head is between 14-33% of the total body length. The eyes are reported as "large" in proportion to the head. The upper jaw was described as protruding, with the mouth in a sub-terminal position. Teeth were reported as sharp, or jagged. When the mouth is closed, it is difficult to recognize. When the mouth is open, it is described as very large in proportion to the head.

There were no fins or appendages reported in any of the Type 2C Animal observations. The tail is described as "tapering," and must be of sufficient surface area to propel the large animal at the substantial speeds (24 km/hr) observed.

Visible respirations were observed in 13% of the reported observations, and described as "very different from a cetacean." The Type 2C Animal's nostrils are probably valvular like other aquatic reptiles (Bellairs, 1970). Surfacing reptiles create very little audible or visual evidence of respiration. It is likely the visible respirations reported were biological functions for expelling excess salt, like those of the Marine Iguana (*Amblyrynchus cristatus*). If the Type 2C Animal were a mammal, it might be expected that exhalations would be more frequently observed or heard.

In 86% of the Type 2C Animal observations, the reported location was the Atlantic Ocean. Remaining observations were recorded in the Indian Ocean and South China Sea. 25% of the observations were recorded in the southern hemisphere. The Type 2C Animal is recorded in the open ocean, and <16 km from the nearest coast.

In the spring and summer months, Type 2C Animals were reported in latitudes of 40-60o. During the winter, the animals were observed in latitudes of 20-25o. There were no autumn observations. It could be suggested that the summer observations were a function of observational effort, and assumed that more summer observations would be reported because human beings tend to become more active (recreation, etc.) on the water during warmer, storm free months. But, more observations were recorded in the winter than during the summer months. It appears the Type 2C Animal may migrate to take advantage of seasonal changes and warmer weather. Type 2C Animals were observed in areas with a water temperature of 10-25oC., and of those observations, 63% were in areas with a water temperature at, or above, 17oC.

An additional argument against the Type 2C Animal's assignment to the Class Reptilia, may be that the ectothermic nature of reptiles would prohibit a marine reptile from frequenting areas of colder water. In the Galapagos Islands, *A. cristatus* flourishes in water <20oC. The Leatherback Sea Turtle (*Dermochelys coriacea*) frequents water with temperatures as low as 6oC. Cooler water temperatures may not appear to be a significant argument in reclassifying the Type 2C Animal.

Type 2C Animals are observed in the morning hours to late afternoon (17:00 hours). Data is insufficient to analyze and test for observational effort at this point in time.

25% of the Type 2C Animal observations were reported in areas of upwelling. These areas were moderate to high in zooplankton and benthic biomass production. 75% of the observations were reported in areas of a high phytoplankton production. The Type 2C Animal appears to occupy a niche as an epipelagic zooplankton (Euphausiids, etc.) predator. Type 2C Animals have been observed swimming at the surface and repeatedly submerging the head with a wide open mouth. In one observation (#178), the animal was observed displaying the submersive feeding behavior in an area confirmed as a migratory route for sardine (Discovery, 2002). The waters the Type 2C Animal frequents are abundant in zooplankton. The Type 2C Animal's teeth may be similar in description to the Crabeater Seal's (*Lobodon carcinophagus*) and serve the same, sieve-feeding purpose.

If the Type 2C Animal occupied a zooplankton feeding niche, reptiles would have representation in a niche they currently do not occupy, and is maintained by most other animal groups (cetaceans, elasmobranchs, pinnipeds, birds, and invertebrates).

The Type 2C Animal appears to be a visually oriented animal (skin coloration, large eyes, etc.). The Type 2C Animal also has been reported in 50% of the observations displaying MB behavior. SH behavior was displayed in 13% of the observations, possibly engaging in these behaviors as an attempt to locate prey. As has been mentioned previously, sea birds, cetaceans, etc. will indicate and group above and around schools of bait fish and krill (zooplankton). It is possible the Type 2C Animal is attempting to locate feeding opportunities by orienting towards such surface disturbances.

Type 2C Animals displayed avoidance behaviors towards the observer(s) in 25% of the observations. Additionally, in 25% of the observations, the animal displayed aggression towards the observer(s) or their vessel. Most often, the aggression was in the form of purposeful tail slaps (usually 2-3 repetitions) directed at the hull of the observers' vessel. Tail slaps are also a common and effective defense employed by known reptile species (iguanids, varanids, etc.).

During a 148 year period (1786-1934), the Type 2C Animal was observed and reported on eight occasions, for a mean average of once every 18.5 years. In the 18th century, the animal was observed on one occasion. In the 19th century, the Type 2C Animal was observed on an average of once every 11.6 years, an increase possibly due to increased maritime traffic. The 20th century included two observations 17 years apart. The 1900's saw a large increase in marine traffic (Couper, 1983), but reported observations decreased. There have been no reported observations since 1934. It is proposed that the Type 2C Animal is a species in decline, or extinct.

TYPE 3 - MULTIPLE-HUMPED ANIMAL DESCRIPTION

The Type 3 Animal was isolated from observations which included an animal with two or more humps. Subsequently, more specific characteristics were defined. Type 3 Animal observations constituted 29% of all sea serpent reports in this study.

Heuvelmans (1965) described a "Many-Humped" animal, elongated with a horizontally bilobate tail. The "Many-Humped" animal was reported to display an ovoid, dorsally flattened head resembling that of an ox. The animal has a medium length neck, with dorsal serrations or fins. The skin is alternately described as smooth, rough, or scaled. The body is cryptically colored, and attains a total body length of 18-30 m.

LeBlond and Sibert (1973) described a fast swimming "Serpentine Animal" with multiple humps visible above the surface, and a head described as "sheep-like." A dorsal fin was reported to run the length of the dorsum. Mangiacopra (1977) identified his Type Four (Many Coiled) animal with a 6-30 m total body length. This animal had a square, seal-like head with prominent eyes. A continuous dorsal fin was also reported, and the body was described as small in diameter when compared to the total body length

The Type 3 Animal attains a maximum length of 60 m total body length (TBL), with the size class of 10-20 m TBL most commonly reported. The diameter of the body is 3-10% of the TBL. The body is cryptically colored, indicating a lifestyle adapted for foraging along the dark substrate while minimizing a presence to predators (large sharks, *Orcinus orca, Physeter macrocephalus*, birds of prey when young, etc.), and/or absorbing the available solar heat at the surface. The skin is smooth in appearance and texture and may also possess an erectile dorsal spine arrangement. Depending upon the observer(s)' viewing angle and the available light, these small spines (often described as yellow in appearance) may appear to be hair-like. It is possible the Type 3 Animal uses this skin system to gain a purchase and maintain position on slippery rocks and/or substrate during feeding or basking behaviors.

There are two pectoral fins positioned approximately 30% of the TBL from the head. A dorsal crest or scutes are present, and a mane has been observed on occasion. The crest is likely a secondary sex characteristic, and has been observed in animals as small as 3.0 m.

The bilobate tail is horizontal in orientation, and plated along the dorsal surface. It appears the tail may retracted or withdrawn to create a minimal profile, thus reducing drag in selected environments and situations, or on the recovery stroke of the swimming motion. This natural armoring may be used as a structural support for the soft-rayed tail during the power stroke of the tail's swimming motion, facilitating the required thrust. The armoring may also serve as a protection from the initial strikes of predators. White Sharks (*Carcarodon carcharias*) may employ an attack strategy of striking and damaging the primary, propulsive appendages of their prey, thus preventing an escape if the prey species survives the initial attack (personal observation).

The tail may also be used for food collection if the animal strikes into schools of fish similar to the Thresher Sharks (*Alopias sp.*) (Compagno, 1984), or to stun prey with the concussion or noise generated from the tail, similar to the Pistol Shrimp (*Alpheus sp.*) strategy (Walls, 1982).

It appears the Type 3 Animal also uses the reinforced tail to generate noise. One observation (#264) described the rattling sound emitted by the tail of a startled, basking animal like that of a "Gatling gun". The animal may employ the vibrating or "rattling" tail to warn potential rivals or predators of the animal's presence, or to demonstrate aggression.

LeBlond and Bousfield (1995) reported and published a photograph of an unidentified animal removed from the stomach of a harpooned Sperm Whale (*Physeter macrocephalus*) in 1937. This probable Type 3 Animal was consumed within the northern range of the Sperm Whale in the eastern Pacific Ocean. Additionally, reported in observation #68, multiple Sperm Whales were observed defending themselves from the attack of a Type 3 Animal, but were likely preying upon the animal. Considering the ranges, behaviors, and migrations of both the Type 3 Animal and the Sperm Whale, it is likely the Sperm Whale preys upon the Type 3 Animal.

Sperm Whales migrate towards higher latitudes during the spring and summer months (Ellis, 1985), as similarly proposed for the Type 3 Animal. Sperm Whales appear to have preferred feeding areas which also over-lap the Type 3 Animal's range, most notably the Aleutian Islands of the northeast Pacific Ocean (in proximity to where the harpooned whale was collected), Newfoundland, and west of the British Isles (LeBeouf, B., 2000). Sperm Whales are also located in the deeper waters proximate to the Mississippi River delta (Evans, 2002), also a proposed and preferred environment for Type 3 Animals. It is possible the Type 3 Animal has adapted the tail morphology to aid in the avoidance of the Sperm Whale's predation.

Sperm Whales emit various communications in the form of "clicks". Depending on the pattern, frequency, etc., these clicks are labeled as "codas." Among the codas are the "rapid clicks" and "machine gun" clicks. These codas may be similar to the rattling noise emitted by the Type 3 Animal.

It was originally believed Sperm Whale codas where used in echolocation of prey in the dark waters of the bathypelagic and benthic zones (Ellis, 1985). It is now proposed that the Sperm Whale utilizes codas as a means of communication with conspecifics (Leonhardt, 1996). It is possible the Type 3 Animal utilizes caudal rattling as a means of masking its identity from the Sperm Whale by mimicking a coda when the Type 3 Animal has sensed the whale's presence.

The cameloid head length dimensions appear to be 5-7% TBL, with the width of the head at 3% of the TBL. Ears, or horns, have been observed on occasion. The eyes have been described as green in color, and forward facing, suggesting binocular vision and a predatory strategy. The mouth is sub-terminal, to ventral in position. The mouth orientation suggests the Type 3 Animal exploits feeding opportunities primarily at, or near, the sea floor (Nikolsky, 1978). The teeth have been described as fish-like and sharp. The palate appears to be textured and may serve as an organ for crushing or securing prey in the mouth (Storer, et al, 1979). The palate may also be a site for vomerine teeth, or a natrial gland for salt excretion/regulation. A tongue has been observed, and described as long, rigid, and "spear-like." It is possible the structure of the tongue allows the Type 3 Animal to impale and retrieve prey in crevices too small for the head to access. Reptiles also possess tongues adapted to predation or food gathering (*Chameleo, Phrynosoma*, etc). The tongue may also be used as an organ to expel water from the mouth cavity in a fashion similar to mysticete whales. Large, prehensile lips have also been reported. These lips may aid the animal in browsing and removing small food items from crevices and difficult-to-access substrates, by providing tactile and/or suction advantage. The ariel senses of the Type 3 Animal appear to be limited, with observations documenting enhanced, subsurface visual and auditory senses recorded.

The Type 3 Animal is likely solitary in nature, and may only be found in the presence of conspecifics during breeding season. The Type 3 Animal has also demonstrated a form of territoriality or aggression towards other species *(Zalophus californianus)*, possibly as potential, and/or perceived, rivals during mating, or competitors to the available food supply.

The Type 3 Animal has been identified with 2-30 humps at the surface of the water, with three most frequently reported. It appears the animal is capable of swimming in excess of 10 km/h. When the animal is perceived to be swimming rapidly at the surface, it is always with a humped posture and vertical undulations. The hump directly behind the head has been described as stationary with the following humps undulating. When the animal is observed basking, floating motionless or swimming slowly, the animal is usually extended. LeBlond and Bousfield (1995) proposed that *C. Willsi*, a similar animal, assumed a humped position to more closely approximate the body shape of a fast-swimming thunniform, therefore assuming a more efficient swimming posture. It is likely the Type 3 Animal employs a similar swimming strategy.

Elementum Bestia

It appears the Type 3 Animal is behaviorally-oriented towards the air/water interface, with head displays (SH, PB) comprising 49% of all recorded observations. It is possible these behavioral displays have caused the Type 3 Animal to have been misidentified as a Type 1 Animal (Long Necked Animal).

Type 3 Animals appear to migrate daily towards the shore, or inland waterways, after 00:00 hours, and under the cover of darkness. The animal then returns off-shore, possibly into the open ocean before 06:00 hours.

The Type 3 Animal has been observed in both hemispheres, but is more frequently reported in the northern hemisphere (90% of observations), with a preferred range of 40-50o latitude. The data suggests the type's preference for the temperate waters over and proximate to the continental shelf, and the boreal air temperatures of shallow and in-shore waterways.

A seasonal migration has been identified within the Type 3 Animal's north-south range (4-60o latitude). During the summer months, the animal appears to migrate as far as 70o latitude, only to return to latitudes in proximity to the equator during the fall and winter months.

With the observation of smaller size-class animals in the higher latitude ranges, it is proposed that the Type 3 Animal mates and gives birth in these more food-productive and fertile areas to maximize growth rate and survival, returning to the lower latitude range only as adults.

The Type 3 Animal was observed in 63% of the total recorded observations in proximity to estuaries and/or river confluences. The majority of observations also included geographic or environmental conditions with a proximity to fully, or semi-protected shorelines, multiple islands, offshore banks, and/or strong tidal currents.

It is proposed that the Type 3 Animal exploits the fertile, brackish waters of estuarine environs throughout the globe. In areas where the Type 3 Animal has been reported with greater frequency, large and productive estuaries and/or river confluences were in the immediate vicinity.

The Type 3 Animal has been reported in freshwater, and appears to have a preference for seawater of <33% salinity. The Type 3 Animal likely ventures into estuaries, and/or up rivers as observed with the large animal in observation #259. There are more observations of the Type 3 Animal swimming up rivers and tidal areas against the outgoing tide, as opposes to movements with tidal movements. Perhaps, the Type 3 Animal exploits the more concentrated animals and organisms for feeding opportunities offered by the lower water levels of the receding tides. It appears the Type 3 Animal may have the capability to venture over land for short distances, and/or may not hesitate to negotiate marshes when conditions permit.

The Type 3 Animal may give birth to precocial young in the relative protection of inland waterways. Animals observed inland are from the extremes of the larger and smaller size classes (4-30 m TBL). The animals observed >5 km inland, were, at times, observed on mud flats, and "basking" on exposed banks.

Typically, the areas of the reported observations were of a high (>500-250 mgC/m2/d) phytoplankton production, moderate to high (>500-50 g/m3) zooplankton production, and moderate (300-1.0 g/m2) benthic biomass production. When the mouth position and morphology of the Type 3 Animal, and available food are taken into consideration, it is proposed that the Type 3 Animal likely preys upon moderately sized species of zooplankton and benthic bony fishes and invertebrates. Although, the Type 3 Animal has been recorded preying upon seabirds, it is proposed that surface species are not the normal or preferred prey items for the animal. Such events may be a reflexive predatory strike, or the exploitation of a seasonally available food source.

The Type 3 Animal appears to be similar to an animal observed and recorded from many locations throughout the world (Eberhart, 2002). When a comparison of some of the more frequently reported, and similar animals to the Type 3 Animal is made, it appears the animals are likely members of the same genus and/or species.

The preferred ranges of both the Type 3 Animal and *Cadborosaurus willsi*, appear to be similar, with known characteristics in 100% agreement. At the moment, the exact range of *C. willsi* is probably unknown as LeBlond and Bousfield concentrated their efforts on local (Pacific Northwest) observations. A similar animal has been observed south, in coastal and river delta locations in California, which may indicate an extended range for *C. willsi*.

Both animals are observed in their proposed ranges, during all seasons. Both animals are also observed in each of the designated area types (open ocean, <16 km from the nearest coast, <500 m from shore, <5 km inland, >5 km inland), in addition to observations of the animal on land.

The eccritic temperature range of Type 3 Animals appears to be broader than that of *C. willsi*. This may be due to the lack of data regarding *C. willsi* in locations other than the comparably small geographic area currently evaluated.

The "Great New England Sea Serpent (GNESS)" of the 1800's, is in 82% agreement with the Type 3 Animal's profile. The main differences between the two animal types, appears to be the reported head descriptions, and the season of reported observations. The GNESS animal is reported most frequently with a snake-like head, as opposed to the more frequently described cameloid head of the Type 3 Animal. The GNESS was only reported during the summer months.

Similar, unknown animals observed in proximity to the United Kingdom and Scandinavia was in 91% agreement with the Type 3 Animal model. Differences were the seasons of reported observations.

An animal reported in countries of Indochina was in 71% agreement with the Type 3 Animal proposal. Differences included head description, and the seasons of observation. Additional, but important, details regarding the tail and fins of the animal are typically not reported, and as such, were not compared with the Type 3 Animal.

TYPE 4 - SAILFIN ANIMAL DESCRIPTION

The Type 4 Sailfin Animal description appears to be comprised of at least two different animal types, each with a prominent dorsal fin. These sail-finned animals are separated by the general description of the head. The Type 4A Animal is described with a long, "crocodile-like" head, and comprises 40% of the Type 4 Animal observations, and 1% of all observations examined in this study. The Type 4B Animal has a small head, usually with the same, or similar, diameter as the neck. Type 4B Animal observations constitute 60% of Type 4 Animal observations and 1.6% overall.

TYPE 4A ANIMAL DESCRIPTION

The lengths of Type 4A Animals most often reported were 9-21 m. TBL. The Type 4A Animal was differentiated from the Type 4B Animal by proportionately larger heads and projecting rostrums.

The Type 4A Animal head appears to comprise 7% of the TBL. The jaws are perceived as large, with 15 cm long teeth. The length of the conical teeth, appear to be 10% of the total length of jaw. Blowholes or spiracles, possibly in a closely positioned pair, have been reported along the head or dorsum. A type of "constricture" or ruffling has also been reported in the area of the neck. The diameter of the round eyes, appear to be .007% of the TBL.

The rigid body is dark in coloration, and rough in appearance. Green warts, scales, or barnacles have been reported in 75% of the reported observation. There were no reports of contrasting ventral coloration.

The rigid, triangular dorsal fin's height appears to be 13% of the TBL. The caudal fins were described as vertical in orientation. It is probable that the Type 4A Animal also possesses a pair of pectoral fins/flippers to provide the lift required to surface and maintain orientation.

Type 4A Animals appear to have limited ariel sensory capabilities, and limited subsurface vision and auditory senses. However, these animals have demonstrated notable olfactory capabilities.

Observations of Type 4A Animals have been recorded during all seasons except winter, and only in the northwestern Atlantic Ocean between the latitudes of 30-50o. It is likely the Type 4A Animal migrates towards lower and warmer latitudes during the colder seasons.

Type 4A Animals were observed in areas with surface temperatures of 5-10oC, while displaying a preference for surface water temperatures of 10-20o. The Type 4A Animal demonstrated a preference for waters of <33% salinity, but was observed in areas with a salinity as high as 36%.

Type 4A animals were observed in areas with moderate to high phytoplankton production, moderate zooplankton production, and high benthic biomass levels. The Type 4A Animal has shown interest in nets of groundfish, and when taken into consideration with the predominant benthic biomass levels, likely exploits a benthic niche.

The Type 4A Animal was last recorded in 1912, after observations were recorded a mean average of every 8 years. It is possible that the Type 4A Animal is either now extinct, or has a population so reduced that the species is no longer viable. More likely, and in agreement with Paxton (1995), is that the Type 4A Animal is a known, or new, species of cetacean rather than a new order of animal.

Using a classification matrix, the Type 4A Animal scored 11 points. This score places the Type 4A Animal even with primitive mammals (11 points), and between plesiosaurs (8 points) and pinnipeds (14 points). If it is also taken into consideration that the described orientation of the caudal fin may have been misinterpreted on the moving animal (which is likely when the orientation and position while swimming is examined), with the actual orientation being horizontal, the Type 4A Animal would be classified higher within the matrix. Current, physiological data is insufficient to determine whether the Type 4A Animal is homeothermic (the proposed migratory pattern is similar to some species of cetacean). Should this be the case, the Type 4A Animal would receive the same classification score as the cetaceans.

The presence of possible blowholes points further to the Type 4A Animal's classification as cetacean, possibly ziphiid. Though the ziphiids, or beaked whales, have a single, crescent-shaped blowhole with the extensions facing anteriorly (Caldwell, 1983), possibly providing the impression of two openings. The size attained by the Type 4A Animal is within the upper limits of known species of ziphiid (*Tasmacetus shepardi*) with the general appearance of the head and rostrum also supporting inclusion into the family Ziphiidae. Head length of known ziphiids is approximately 16% TBL, as compared to the Type 4A Animal's 7% TBL head. The teeth of the Type 4A Animal were observed to run the length of the jaw, which are not typically present in ziphiids. However, some species of beaked whale have longer prominent tusk-like teeth, with Shepard's Beaked Whale (*Tassmacetus shepardi*) possessing a full complement of teeth (48 pair) as an exception.

The heights of ziphiid dorsal fins vary from 3-7% TBL, while the Type 4A Animal's dorsal fin is approximately 13% TBL. The positioning of the dorsal fin in ziphiids is (60-75% TBL) is similar to the Type 4A Animal's morphology, at 60% TBL.

Problematic with the cetacean proposal, would be the greenish scales or barnacles in the head area of Type 4A Animals. While there is some color variation within some species of beaked whales, the greenish growths causing the described "rough" appearance may be a barnacle common to, or a parasite specific to the species, as is found in other large marine animals (*Somniosus sp.*) Perhaps, the dermis of the Type 4A Animal is predisposed to irregularities, or algal growth.

The beaked whales are not commonly observed, and some species are known only from carcasses. When the morphology, range, migrations, and ecological niche are examined, it is likely the Type 4A Animal is a new species of cetacean, most likely within the family Ziphiidae.

TYPE 4B ANIMAL DESCRIPTION

Type 4B Animals have been observed and reported with total body lengths (TBL) of between 4-26 m. The width of body appears to be 5-7% of the TBL. The Type 4B Animal body is described as large, and with a dorsal coloration from dark gray to blue, or dark brown. The Type 4B Animal is cryptically colored with a lighter colored ventrum. A "tapered" tail of unknown length and/or dimension is also reported.

A "fan-like" dorsal fin maintains a length of 30-60% of the TBL, with a height 1-5% of the TBL, and positioned approximately 30-45% of the TBL from the head.
Interestingly, the Type 4B Animal utilizes an ostraciform, or "sculling", movement of the dorsal fin when swimming minimally at, or near, the surface. Known genera (Ostracion, Gymnarchus, Mola, Hippocampus, etc.) using similar locomotion, whether periodic or continuous, are regarded as slower swimmers (consistent with Type 4B Animal reports), and typically exploit benthic environments, or are sluggish pelagic predators (Moyle, 1988).

The proportionately small, "tortoise-like" head (once described as "ostrich-like") is of the same, or similar, diameter as the neck. The length of this dorsally flattened head is 7% of the TBL, and the width is 9% of the TBL. The head has been reported to sway laterally while the animal swims at the surface, possibly the result of the ostraciform swimming movement.

The Type 4B Animal has exhibited behaviors suggestive of a visually-oriented animal and has displayed good to excellent ariel vision. It is likely the Type 4B Animal uses its large eyes to locate distant feeding opportunities (surface disturbances and events).

The mouth is described as large, toothless, terminal to sub-terminal in orientation, with lips and "tendrils". Nares, nostrils, or blowholes have not been described, but Type 4B Animals have been reported with repetitive audible exhalations.

The Type 4B Animal is observed and reported a mean average of once every 20.1 years, with the last reported observation in 1999. Type 4B Animals have been observed and reported in both hemispheres between the latitudes of 21-61o, and in all seasons except winter. Type 4B Animals are most frequently reported in the open ocean and in areas less than 16 km from the nearest coast. The Type 4B Animal appears to move closer to the coast/shore during morning hours, only to return to open water later in the day, and have never been reported inland.

The preferred water temperature appears to be between 7.5-26o C., with a preferred surface temperature of 5-20o C. The salinity of the water in areas where the Type 4B Animal was reported was between 33-37%. Type 4B Animals were reported in areas of moderate to high phytoplankton production, moderate zooplankton production, and moderate to high benthic biomass production.
Using the LeBlond and Bousfield Classification Index, the Type 4B Animal scored 8 points, the same total as the plesiosaurs, and equally between the modern reptiles and primitive mammals. It could be considered that the Type 4B Animal may be a transitional animal with reptilian and mammalian characteristics.

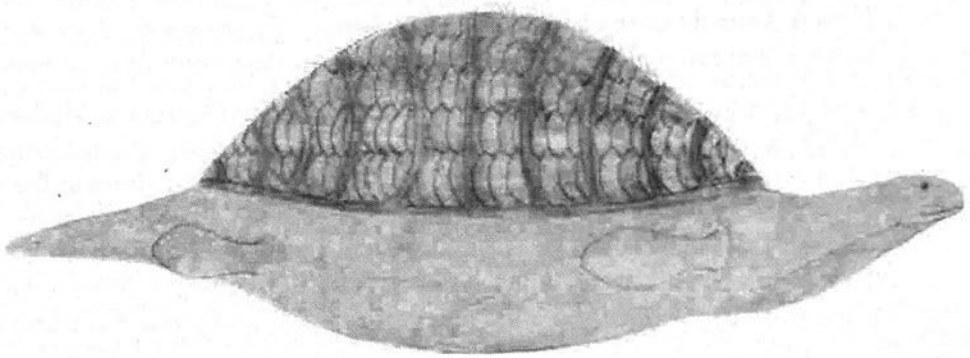
The swimming motion of this animal lends itself to slow, precise feeding. Further, the mouth orientation and oral appendages also suggest a benthic feeding strategy, probably upon small fish and invertebrates. The longer neck may allow the animal feeding access to difficult substrates, or to breath without completely surfacing when feeding in shallow water, as reported. The oral appendages likely allow the animal to sense, locate, and suction smaller prey items from crevices and surfaces that would be difficult to collect without the added flexibility. The Type 4B Animal has also been reported browsing small offerings and carcasses at, or near, the surface. It is therefore proposed that the Type 4B Animal has a euryphagic feeding strategy. The long neck, good ariel vision, and associated surface behaviors also appear to aid in the animal's surface navigation, either for locating feeding opportunities, or identifying conspecifics or predators.

Cryptic coloration lends itself to the animal's protection from predators when feeding along the bottom by blending the image of the Type 4B Animal with dark substrate. Additionally, as this animal also appears to engage in extended and/or frequent periods at the surface, the lighter colored ventrum would minimize backlighting and detection by predators below it.
Type 4B Animals are solitary, and likely give birth to live, precocial young, birthing areas in proximity to equatorial latitudes during a winter migration.

TYPE 5 - CARAPACED ANIMAL DESCRIPTION

The Carapaced, or Type 5 Animal, was classified when an observation described a plated or hard shell-like carapace, or an integument suggesting such an exterior. Type 5 Animal observations comprised 2.5% of the total number of useable observations.

In this database, Type 5 Animal observations were first recorded in 1744, and last reported in 1969, for a mean average of one observation every 25 years. Currently, the Type 5 Animal has exceeded the mean observational average by 10 years, thus expanding the mean average to one observation every 28.9 years.



The Type 5 Animal is described as "plated" or with a hard, shell-like carapace, or a skin structure of a similar appearance. The carapace was described as both dome-like, and slightly flattened. The coloration of the Type 5 Animal displays more variability (spots, alternating bands) when the animal is smaller. This coloration may aid the animal in confusing its general outline to predators.

The Type 5 Animal may not develop the carapace-like structure until reaching the approximate size of 6.5 TBL. When the carapace is present, it is described as grey, white, and greenish-brown in coloration and reported as jointed, and/or segmented. The TBL has been reported between 3.07-13.71 m. The width of the body is 75-90% of the TBL, with the dorso-ventral thickness at 60-70% TBL.

The head is alternately described as "turtle-like," "seal-like," and blunt or rounded in appearance. Quill-like dorsal structures have been reported, as has a type of oily hair. The Type 5 Animal also has an expandable gullet and/or throat, which may increase the diameter of the throat by 40%. Type 5 Animals possess two pair of blunt, rounded, or paddle limbs. The long tail is described as wedge-shaped, and blunt.

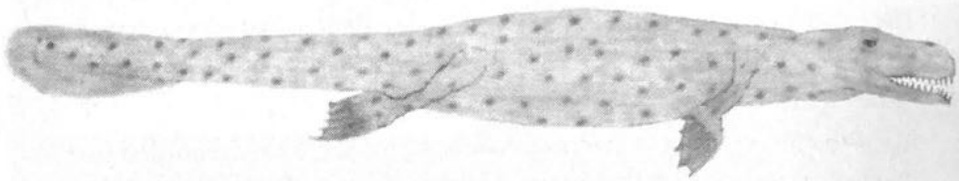
Type 5 Animals are observed in the open ocean in cooler climes, and also in areas up to, and including the shore in summer and winter months, and in both hemispheres in the Atlantic, Pacific, and Indian Oceans. Type 5 Animals appear to maintain a range of 18-62o latitude, with a preference of latitudes in proximity to 40o. Type 5 Animals occupy areas with a high phytoplankton production, moderate to high zooplankton production, and moderate to high benthic biomass, maintaining a euryphagic, planktoniverous feeding strategy within the epipelagic zone. Preferred water temperatures are 10-28o C, with preferred surface temperatures at 5-20+o C. The Type 5 Animal prefers water with a salinity of 33%, but tolerates a salinity of up to 36%.

Type 5 Animals are solitary when adults, but maintain associations when younger. The Type 5 Animal grouping may be comprised of large anapsids, but is most likely a reptile-like mammal, or transitional/intermediate animal of an unknown class.

TYPE 6 - SAURIAN ANIMAL PROFILE

The Type 6 Animal was identified and separated from other animal types by a general description of a saurian morphology. This generic description included four limbs, a tail, and an elongate head. Type 6 Animal observations comprised 1.3% of the total reported observations examined in this study. The mean average credibility score for this group was 6.2 points.

The Type 6 Animal was described with a total body length (TBL) of 1-20 m, with no comparable proportions identified. The elongate head was alternately described as "crocodilian," "seal-like," or "lizard-like." The skin is described as both smooth and rough in appearance, and scutes were not described.



Two pairs of limbs were described with webbed toes. The posterior limbs are described as longer than the anterior pair. The tail is described as "long" or "indefinable" in appearance. The homogeneous dorso-ventral coloration of the Type 6 Animal is brown and/or gray, with a possible darker, spotted coloration.

Type 6 Animals were observed a mean average of once every 22 years. The Type 6 Animal has exceeded the mean, observational average by 14 years with the last, credible observation recorded in 1990.

The Type 6 Animal inhabits only the North Atlantic Ocean and Mediterranean Sea between the latitudes of 37-62o in all seasons. There appears to be no seasonal migration. However, the animals exhibit daily movement by remaining in water <16 km from the nearest shore in the afternoon hours, and approaching the shore and inland waterways during hours of darkness. Eccritic water temperatures are 10-14o C. Type 6 Animals do not frequent areas with surface temperatures <10o C, or >20 o C., or areas with oceanic upwelling. The preferred salinity of Type 6 Animals is between 33-37%. Type 6 Animals frequent areas of high phytoplankton production, moderate-low zooplankton production, and high benthic biomass production.

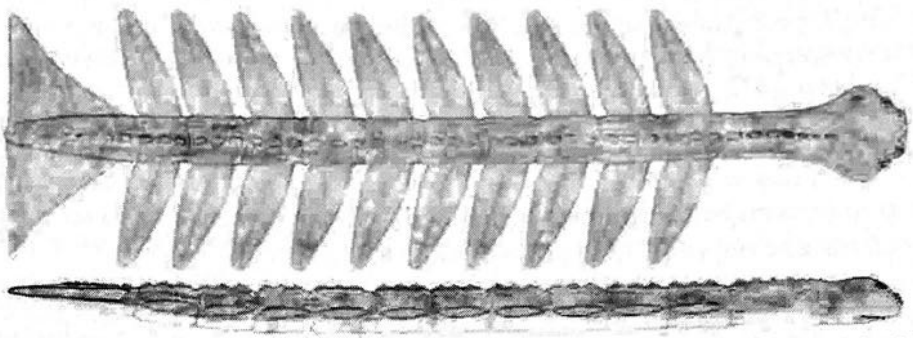
TYPE 7 - MULTIPLE-LIMBED/SEGMENTED ANIMAL DESCRIPTION

The Type 7 Multiple-Limbed/Segmented Animal was described as a sea serpent type animal with a multiple, segmented body with a pair of limbs, fins, or other appendage originating from each segment structure. The total of Type 7 Animal observations in this study accounted for 2% of the total number of observations reviewed, with an average credibility rating score of 6 points. 50% of the Type 7 Animal observations were described from carcasses, with 33% of those observations recorded photographically.

With the no thermal regulatory and reproductive data available, these characteristics, and their accompanying scores, were not entered into the classification matrix. When the known characteristics of the Type 7 Animal are entered into a classification matrix, the Type 7 Animal received a score of 11, equal to that of primitive mammals. It is possible, that when applying the characteristics and associated scores of the primitive mammals to the original score with the unknown and un-scored characteristics, that the Type 7 Animal may score similarly to pinnipeds, and the same, or slightly less, than cetaceans.

The Type 7 Animal is a solely marine animal with a maximum TBL of 20 m. The width of the finless body is 5% of the TBL. The animal is cryptic and mottled in coloration, usually in shades of brown to yellow. The elongate body of the Type 7 Animal presents the appearance of segmentation, and may include dermal plaques or dorsal scutes which have been described as rigid and or chitonous. It is more likely the skin is not chitonous, and more leather-like in description. The body may be cylindrical, and dorsally rounded in appearance. When decomposing, the body has a "furry" texture and appearance, and the head usually separates from the body. A layer of fat may be present, with the thickness approximately 2% of the TBL.

Elementum Bestia



The number of distinctive, but reduced, lateral appendages of up to 10 pair, have been described as "flippers." Some reports have indicated a pair of appendages/flippers per segment. The width of the appendages is 5% of the TBL, with the length of the appendages approximately 12% of the TBL. The width of the tail appears to be approximately 26% of the TBL. The proportionally reduced lateral appendages likely function as stabilizing and protective structures, as opposed to locomotive aids. These lateral appendages are moderately inflexible, to completely rigid. The horizontally-oriented tail and the vertically undulating body provide the main propulsion for the animal's surface movements.

The Type 7 Animal rolls and/or banks the entire body laterally, to change direction. The animal also submerges and surfaces in series, with surface swimming speeds described as moderate to fast. The Type 7 Animal has been observed in the presence of small cetaceans.

The head has been described as "walrus-like" with prominent, dorsally-positioned eyes. The visible, terminally-positioned nostrils have proximate vibrissae. Aerial senses appear to be limited. Exhalations may be observed both audibly and visually. The mouth is positioned ventrally, with the width approximately 11% of the TBL.

Type 7 Animals are observed a mean average of once every 26.8 years, with the last observation recorded in 1990. Typically, the observations are of an extended period of time, and in close proximity to the animal (<75 m.). Half of the observations were made of carcasses, with 33% of those photographed. Observations were recorded in the western North Atlantic, western Indian, and western Pacific Oceans in both the northern and southern hemispheres, though observations are more frequent in the northern hemisphere. The range of the Type 7 Animal appears between 21-63o of latitude.

The Type 7 Animal inhabits water with a temperature range of 7.7-26o C., with 66% of all observations reported in areas with a water temperature of 7.7-20o C. Reported observations (67%) indicate a predominantly boreal biogeographic preference in surface/air temperature (5-10o C.).

Observations of live Type 7 Animals are usually made in the open ocean, and in areas <16 km from the nearest shore. The animal does not frequent near-shore (<500 m from the shore) and inland areas, or areas with oceanic upwelling. The Type 7 Animal may be found in areas with a salinity ranging from 33-37%, a moderate to high phytoplankton production, low to moderate zooplankton production, and moderate benthic biomass production.

When the characteristics scored in a classification matrix are considered with behavioral and physiological characteristics, it is likely the Type 7 Animal is a member of Class Mammalia. As the cryptic coloration of the animal is examined, the locomotive capability regarded, and the ventrally positioned mouth, dorsally placed eyes, and vibrissae are considered, the Type 7 Animal should be identified as a benthic feeder, exploiting an environmental niche feeding on sessile animals and slow-moving fish. The eye position allows the animal to watch for potential predators when feeding along the bottom. The placement of the nostrils also allows the animal to breathe at the surface without breaching the surface, and also reducing opportunities to observe the animal.

TYPE 8 - DIGITED ANIMAL DESCRIPTION

The Type 8 Animal was generally described as an unknown marine animal with digits extending from the feet or corresponding appendages. Heuvelmans reported only one observation of an animal fitting this description, and identified the animal as being either a "Long Necked" or "Merhorse" serpent (1965). No other researchers known to the author, have to date specifically described the Type 8 Animal.

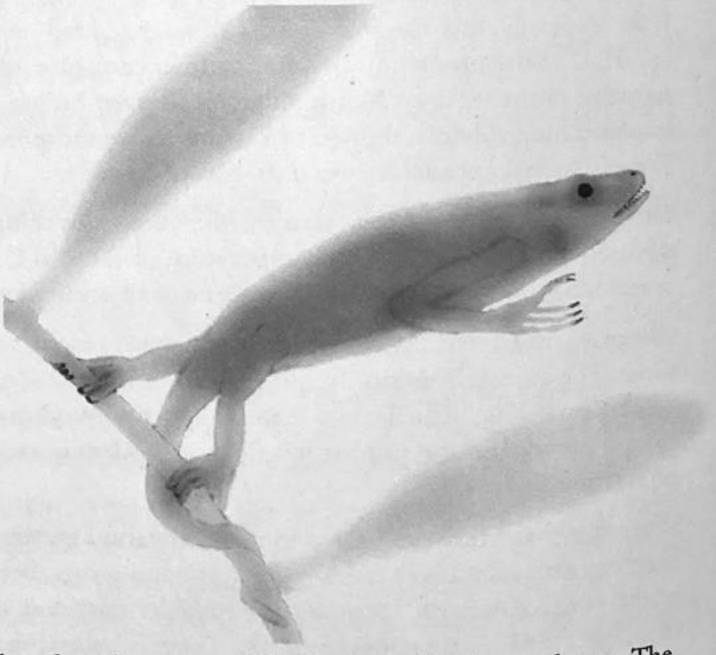
Type 8 Animal observations comprised 1% of the total number of useable observations. 50% of the observations had a credibility rating of 7, with the remaining 50% scoring a credibility rating of 5. Stranded carcasses comprised 75% of the reported observations.

The Type 8 Animal is specifically described as a four-limbed marine animal, with a possibly prehensile tail. Each jointed limb possesses up to five opposed digits, possibly bundled in a 2 versus 3 arrangements. The head is chameleon-like in appearance with large, prominent eyes and strong, sharp teeth. Nostrils have also been reported. The skin is tough, scaleless in appearance, and pink to red or brown in coloration. The total body length (TBL) for mature animals is approximately 1.22 m.

Type 8 Animals have been observed a mean average of once every 40 years, with the last observation reported in 1995. The Type 8 Animal inhabits the semi, to unprotected coastlines in the temperate zones of the Pacific and Atlantic Oceans between the latitudes of 30-55o. Specifically, these habitats include areas with a high phytoplankton production (>500 mgC/m2/d), moderate to high zooplankton abundance (>500-200 mg/m3), and moderate benthic biomass (10-50 g/m2). The preferred salinity of the Type 8 Animal is 33-34%.

Using a classification matrix for aquatic vertebrates, the Type 8 Animal score corresponds directly to that of an amphibian, and one point less than the modern reptiles. It is possible the actual score of this type could be higher and more accurate if a larger data set could be obtained.

The characteristic digited limbs appear to correspond similarly to that of known arboreal species. The chameleons (*Chameleo sp.)* and Koalas (*Phasocolarctos cinereus*) also have opposable digits in a similar arrangement which allow them to move about securely in trees and brush. Though these limbs do not allow for relatively rapid movements, the opposable feet do provide a secure purchase as the species either browses or maintain position for feeding opportunities, and/or minimizes exposure to predators. It is proposed that the Type 8 Animal utilizes opposable digits in a similar strategy.



It is possible the Type 8 Animal inhabits kelp (*Macrocystis sp.)* forests and related and proximate structures. The Type 8 Animal's size (maximum size of 12 kg.) and coloration may allow the animals to negotiate the kelp canopy with reduced opportunities for detection by predators. The opposable digits also provide the animal with a means of securely moving through the kelp forests in the associated wave/current swept environment. The tail may also aid the animal in maintaining position.

The Type 8 Animal has not been described with any specialized feeding adaptations that would indicate primary predation upon species capable of rapid escape or evasion. The large prominent eyes may suggest a nocturnal feeding strategy on sessile or slow-moving prey (crustaceans, molluscs, etc.) known to inhabit kelp canopies. Alternatively, the Type 8 Animal may use the described strong, sharp teeth to feed directly upon macro-algae.

TYPE 9 - SNAKE-LIKE ANIMAL DESCRIPTION

The Type 9 Animal is generically described as snake-like in appearance, with a squared head and visible scales, and a TBL of 6-18m. Coloration was not specifically described, but a uniform coloration could be assumed for piscivorus, predatory strategies. The Type 9 Animal appears to be a modern reptile, having scored a 4 in a classification matrix and demonstrating thermoregulating and skin sloughing behaviors consistent with known reptiles.

The rate of observation of the Type 9 Animal has exceeded the mean average between reported observations, with the last recorded observation reported in 1880. The Type 9 Animal appeared to favor estuarine and or coastal environments, which have been reduced in productivity (Hinrichsen, D., 1998.). It is possible the Type 9 Animal has been displaced from its normal range, and may now be extinct.

Type 9 Animals could be observed between the latitudes of 39-58o, and only in the Atlantic Ocean, and not in areas of upwelling. If the species remains, it may be found in areas with a salinity of 33-35% a water temperature between 7.5-17.5o C, and a surface temperature range of 5-20o C. The Type 9 Animal likely prefers areas with a high phytoplankton production, moderate to high zooplankton abundance, and a moderate benthic biomass.

CONCLUSION

This summary references a thesis proposing a scoring system for evaluating the veracity of reported observations. By using a predetermined scoring system to evaluate reports, emotion and subjectivity are minimized, with a standardization refining the various datasets.

This work also extends type proposals based on affirmative theory. The author believes that such a format would be useful in examining subsequent and infrequent observations. By the continued, corroboration, refutation, and/or modification of the type proposals, the dataset can be more effectively clarified and enlarged, while maximizing limited observational opportunities. Eventually, the tested dataset can be used towards the collection and formal description of a type specimen.

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Bruce Champagne holds a B.S. degree in Marine Biology and has been researching and writing on cryptozoology for nearly 30 years. Bruce currently works in law enforcement in the state of Utah, and continues his analytical work on "sea serpents" and related mystery animals.